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(56) Documents Cited

GB 2283997 A

GB 2267298 A

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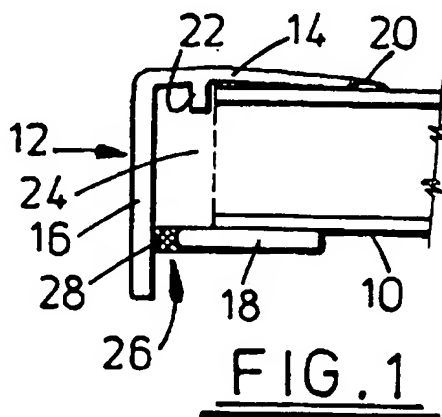
INT CL⁷ E04C 2/54, E04D 3/06

EPODOC WPI JAPIO

(54) Abstract Title

End cap for a multi-layer panel

(57) An end cap (12) for a ducted plastic panel (10) has an upper limb (14) with gasket material (20) extending from its free edge. When the end cap (12) is fitted to the panel the gasket (14) lies on the panel surface to prevent ingress of water. The end cap (12) also includes means to prevent ingress of material (26) such as dust and insects, whilst allowing ventilation of the ducts. The gasket material (20) can be made of rubber or other elastomeric material and be either extruded with the end cap (12) or bonded thereto. The end cap (12) may have apertures for ventilation/drainage, which can be covered by a porous material (26) such as foam, mesh or breather tape. The apertures may be situated in a number of different position on the end cap. The end cap may have a removable drip plate (86, fig 3, not shown); internal ribs (22) for the abutment of the panel or include desiccant material (106, fig 4, not shown). There is also described a means for plugging individual ducts.



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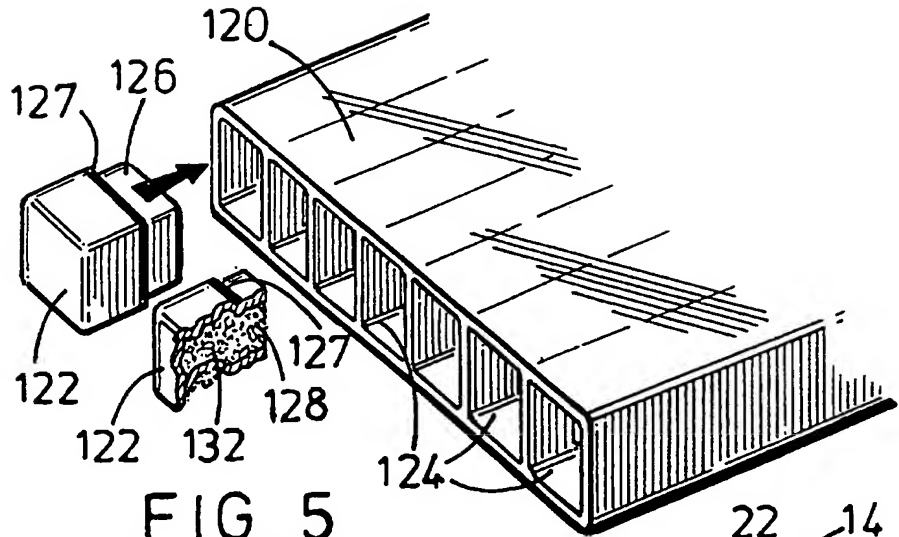


FIG. 5

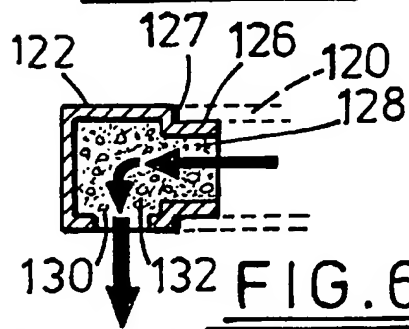


FIG. 6

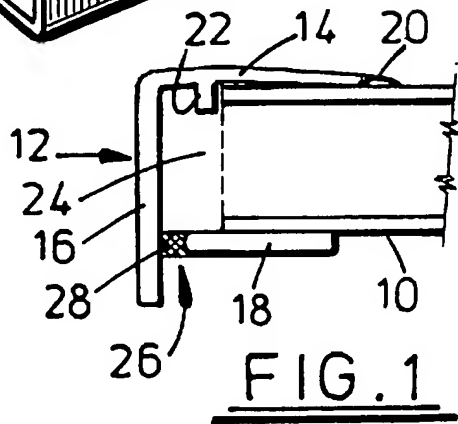


FIG. 1

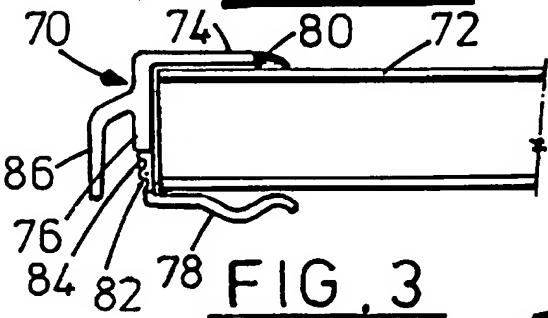


FIG. 3

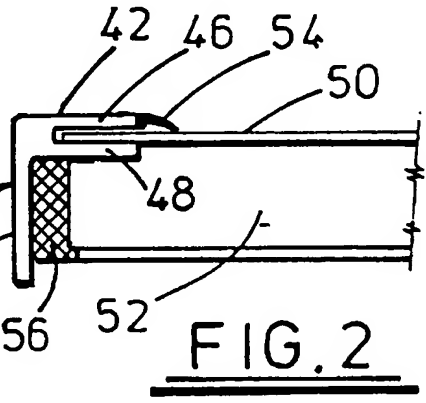


FIG. 2

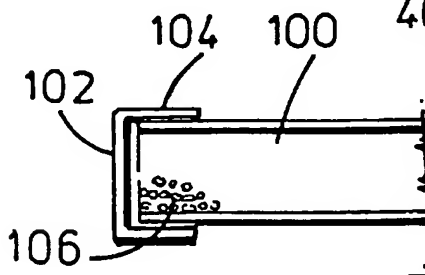
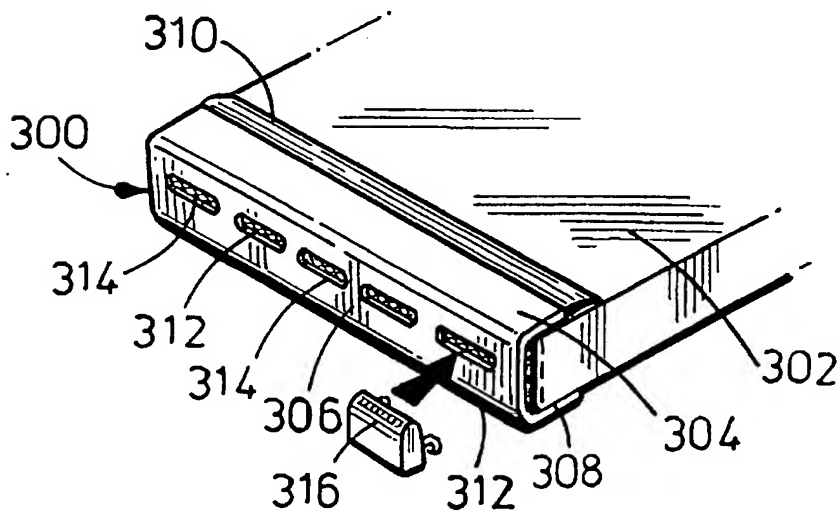
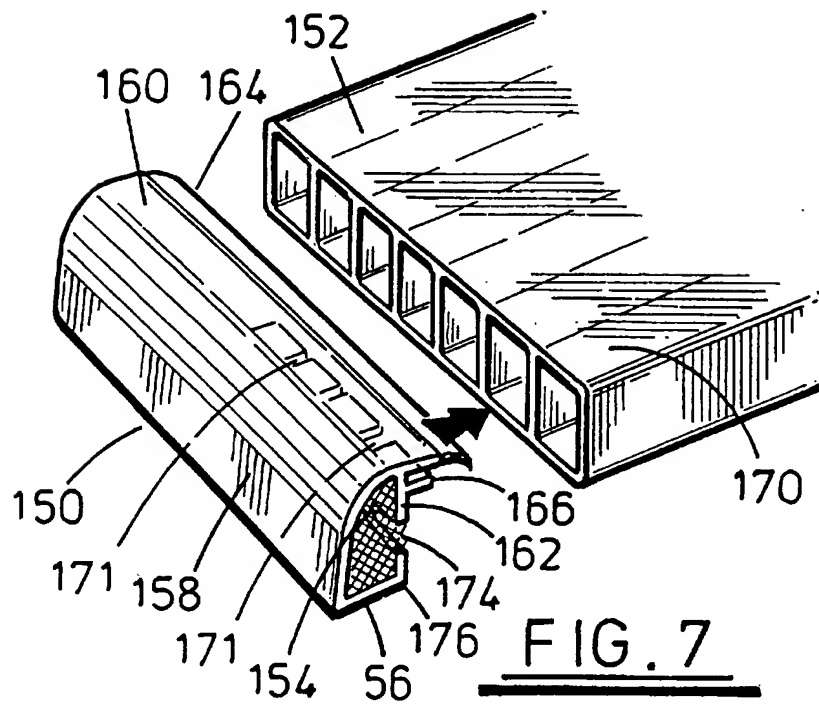
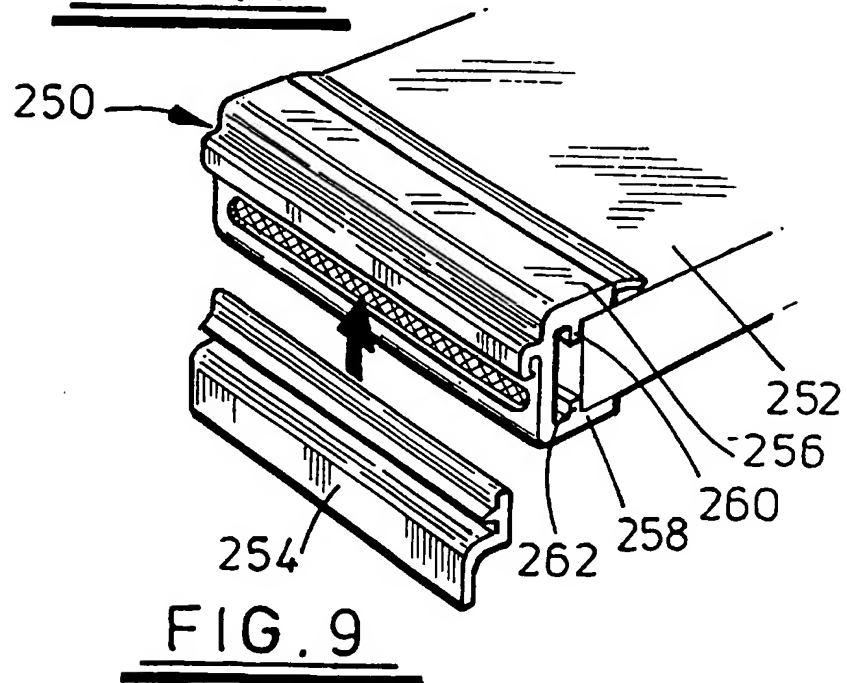
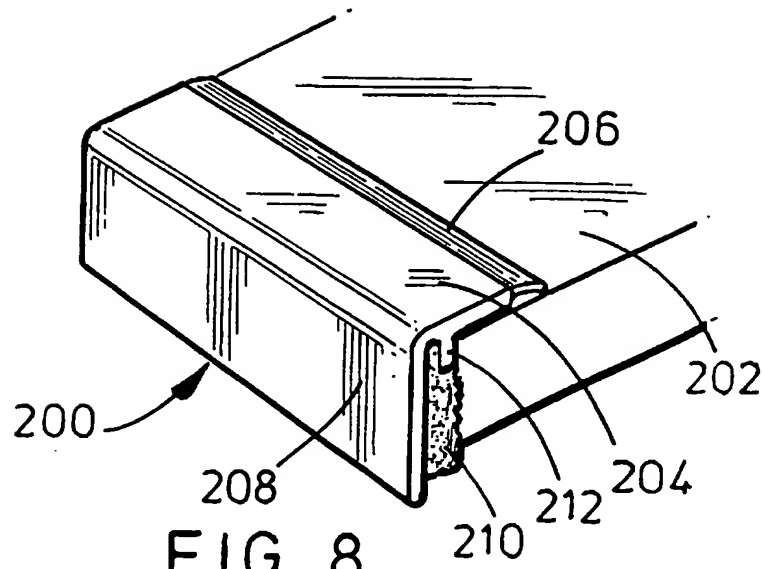


FIG. 4





TITLE: Installation of roofing panels.

Description

This invention concerns installation of roofing panels.

Conservatories and like structures can have a roof structure comprising parallel glazing bars extending from one or both sides of a ridge member with glazing panels supported between the glazing bars. Glazing material is typically polycarbonate sheeting, which may have two or more skins joined at their edges and intermediate their edges to form longitudinal ducts through the panels. Polycarbonate is hygroscopic and so condensation occurrence within ducted polycarbonate glazing panels is a natural phenomenon. When such panels are fitted to a conservatory roof, the ends of the panels are sealed at lower ends with a breather tape to allow condensation to drain away or evaporate. The tape also prevents insects entering the panels. The ends of the panels may then be covered with an end cap, although polycarbonate panels are generally not as flat as glass panes, so that some ingress of water is possible between the polycarbonate panels and their end caps, which eventually finds its way into the polycarbonate panels themselves.

In GB 2283997, an end cap for ducted plastics panels was proposed, which comprises a channel section member having an intended upper side and an intended lower side, the upper side including a coextruded gasket extending away from and beyond its free edge, whereby, when the end cap is pushed onto a

plastics panel, the gasket lies on the panel surface to limit the passage of water past the gasket.

Such end caps have proved to be reasonably effective against water ingress from rainwater falling on top of the panels. However, the preferred end caps have an internal rib which acts as a stop for the polycarbonate panel, so that there are gaps at each end through which dust or insects can enter the polycarbonate panels.

It is important, however, to ensure that there is ventilation through the polycarbonate panels to allow condensation to evaporate or flow away, whilst limiting dust or insect ingress into the polycarbonate panels.

An object of the invention is to provide end caps for use on plastics glazing panels of the ducted type.

According to a first aspect of the present invention there is provided an end cap for a ducted plastics panel the end cap having an intended upper side including gasket material extending away from and beyond its free edge, whereby, when the end cap is fitted onto a plastics panel, the gasket lies on the panel surface to limit the passage of water past the gasket, and means for limiting ingress of dust and/or insects into the panel ducts whilst allowing ventilation of the ducts.

The gasket material, such as of rubber or synthetic elastomeric material, is preferably co-extruded on or bonded to the end cap.

In one preferred embodiment of the invention the end cap has apertures for drainage and/or ventilation, which apertures are covered by a porous material.

Examples of suitable porous materials include porous foam, mesh and breather tape. The apertures may be at ends of the end cap, in a wall thereof to face the end of the plastics panel or in a wall of the end cap that will extend below the plastics panel when the end cap is fitted thereto. The apertures when in the facing wall may be provided with covers that are open downwards.

The facing wall of the end caps of the invention may also be provided with an integral or removable drip plate extending therefrom.

The end caps of the invention may have internal ribs which abut against a plastics panel when fitted to leave a ventilation space between the end of the plastics panel and the facing wall of the end cap.

According to a second aspect of the invention there is provided means for sealing ducts of plastics glazing panels against ingress of, for example, dust and insects comprising plug means for fitting individual ducts, said plug means including a drainage passage for water to escape from the duct.

The plug means preferably includes a porous material, especially a porous foam. The plug means preferably also have seal members around their necks for sealing against the end of the ducts of plastics panels.

It may be desirable to include a desiccant material in the plastics panels or in the end caps to absorb moisture.

This invention will now be further described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a first end cap according to the invention;

Figure 2 shows a second end cap according to the invention;

Figure 3 shows a third end cap according to the invention;

Figure 4 shows a fourth end cap according to the invention;

Figure 5 shows plug-in end caps of the invention;

Figure 6 is a section through an end cap of Figure 5;

Figure 7 shows a sixth end cap of the invention;

Figure 8 shows a seventh end cap of the invention;

Figure 9 shows an eighth end cap of the invention; and

Figure 10 shows a ninth end cap of the invention.

Referring to Figure 1 of the accompanying drawings, a ducted glazing panel 10 of polycarbonate has an end cap 12 fitted onto one end thereof. The panel 10 is typically used in forming a conservatory roof. The end cap 12 comprises a channel section member having an upper sidewall 14, a base 16 and a lower sidewall 18. The upper and lower sidewalls converge slightly away from the base 16.

The upper sidewall 14 has along its free edge a coextruded gasket of rubber or synthetic elastomeric material 20. The gasket narrows towards its free edge and is angled downwards slightly relative to the upper sidewall 14. Near its junction with the base, the upper sidewall has an internal rib 22, which acts as a stop for the polycarbonate panel 10 pushed into the end cap so as to provide a ventilation chamber 24 at the end of the plastics panel 10.

The lower sidewall 16 has near its junction with the base a series of spaced apertures 26 along its length. In or possibly over the apertures 26 is a mesh-like material or porous tape 28, whereby ventilation of the ducts of the panel 10 is

possible but ingress of dust and/or insects is preventable.

The base 16 of the end cap continues below the lower sidewall 18 to provide an edge from which water drops can fall rather than travel backwards under the end cap.

Turning to Figure 2 of the accompanying drawings, an end cap 40 is generally of inverted L-section having a top wall 42 and a base 44. The top wall 42 has two parallel leaves 46, 48 to provide a slot into which the wall 50 of the ducted plastics glazing panel 52 fits. The bottom leaf 48 is notched to accommodate vertical duct forming walls of the panel 52. The top leaf 46 has on its free edge a coextruded gasket 54 of rubber or other suitable elastomeric material to provide a seal between the top wall 42 and the top surface of the panel 52.

On the inner surface of the base 44 is a mesh or porous foamed material 56 to act as an insect stop but allows ventilation of the panel ducts. The material 56 is compressed between the base 44 and the end of the panel 52.

In Figure 3 of the accompanying drawings, an end cap 70 for a ducted plastics glazing panel 72 is a channel section having a top wall 74, a base 76 and a bottom wall 78. The top wall 74 has coextruded gasket material 80 along its free edge. The base 76 of the channel section has a longitudinal slot 82 therein which receives a mesh strip 84 to provide for both ventilation of the ducted panel 72 and a barrier to insects.

Extending outwardly and downwardly from the outer face of the base 76 is a drip plate 86, whereby condensation water can travel down the plate 86 and form drops that fall off rather than travel back under the end cap.

Figure 4 shows an alternative approach to the prevention of condensation formation within a ducted plastics glazing panel 100. A single channel section end cap 102 is fitted onto the end of the panel 100. The channel top wall 104 may have coextruded gasket material on its free edge. A desiccant material 106 is enclosed within the plastics panel by means of the end cap 102. Desiccant material may be used in a similar way in any of the other illustrated embodiments of the invention.

Referring to Figures 5 and 6 of the accompanying drawings, instead of an end cap that can be cut to length for a particular ducted plastics glazing panel, the panel 120 is provided with individual plugs 122 for each duct 124. The plugs 122 have rebated ends 126 which are friction fits in the ducts 124. Sealing material 127, such of rubber or synthetic material, is provided around the rebated ends. The plugs have their rebated ends open at 128 and have an open sidewall 130, so that a passage is provided through each plug to allow water drainage as shown in Figure 6.

To prevent dust or insect ingress into the panels via the plugs, they are filled with porous foamed material 132. To seal against the end of the panel, the plugs 122 have around their rebates gasket material 134.

Turning now to Figure 7 of the accompanying drawings, an end cap 150 for a ducted plastics glazing panel 152 has a hollow section body 154 with bottom wall 156, a rear wall 158 extending from one side of the base and curving to form top wall 160, and a front wall 162 from the other side of the base. The top wall 160 extends beyond the junction with the front wall 162 and has coextruded gasket

material 164 along its free edge. Just below the top wall 162 extending from the front wall is a leaf 166 that is parallel to the top wall and forms therewith a slot into which the glazing panel top wall 170 can be a friction fit. The leaf 166 is notched 171 at spaced intervals to accommodate the vertical duct forming walls 172 of the panel.

The front wall 162 of the end cap 150, has slots 174 therein to provide ventilation for the panel ducts. At each end the end cap is plugged or covered with mesh or porous foamed material 176 to prevent insect ingress.

In Figure 8 of the accompanying drawings, an end cap 200 for a ducted plastics glazing panel 202 is generally L-shaped having a top wall 204 with coextruded gasket material 206 along its free edge and a depending wall 208 on the inner surface of which is a porous foam strip 210 that adheres to the panel end. Depending from the top wall 204 near its junction with wall 206 is a spacer rib 212.

Figure 9 of the accompanying drawings shows an end cap 250 for a ducted plastics glazing panel 252. The end cap 250 is similar to that of Figure 3 of the drawings except that its drip plate 254 is formed as a separate item that can be clipped in place, if required, and that top and bottom walls 256, 258 have spacer ribs 260, 262 respectively on the inwards surfaces.

Finally in Figure 10 of the accompanying drawings, an end cap 300 for a ducted plastics glazing panel 302 is a channel section member having a top wall 304, a base 306 and bottom wall 308. The top wall 304 has coextruded gasket material 310 along its free edge. The base 306 has a series of slots 312 therein covered internally by a porous tape 314 to act as vent holes for the ducts of the

panel 302.

Push fit covers 316 may be provided to close the slots 312 against rain ingress. The covers 316 are open to the slots 312 and below to maintain ventilation passageways.

Where reference has been made to co-extruded gasket material, an alternative is to bond gasket material onto the end caps.

CLAIMS

1. An end cap for a ducted plastics panel the end cap having an intended upper side including gasket material extending away from and beyond its free edge, whereby, when the end cap is fitted onto a plastics panel, the gasket lies on the panel surface to limit passage of water past the gasket, and means for limiting ingress of dust and/or insects into the panel ducts whilst allowing ventilation of the ducts.
2. An end cap as claimed in claim 1, wherein the gasket material is of rubber or synthetic elastomeric material.
3. An end cap as claimed in claim 1 or 2, wherein the gasket material is co-extruded with the end cap.
4. An end cap as claimed in claim 1 or 2, wherein the gasket material is bonded onto the end cap.
5. An end cap as claimed in any one of claims 1 to 4 having apertures for drainage and/or ventilation, which apertures are covered by a porous material.
6. An end cap as claimed in claim 5, wherein the porous material is selected from porous foam, mesh and breather tape.

7. An end cap as claimed in claim 5 or 6, wherein the apertures are at ends of the end cap.
8. An end cap as claimed in claim 5 or 6, wherein the apertures are in a wall of the end cap to face the end of the plastics panel.
9. An end cap as claimed in claim 8, wherein the apertures have covers that are open downwards.
10. An end cap as claimed in claim 5 or 6, wherein the apertures are in a wall of the end cap that extends below the plastics panel when the end cap is fitted thereto.
11. An end cap as claimed in claim 8, wherein the facing wall of the end cap has an integral or removable drip plate extending therefrom.
12. An end cap as claimed in any one of claims 1 to 11 having internal ribs for abutment against a plastics panel to leave a ventilation space.
13. An end cap as claimed in any one of claims 1 to 12 including desiccant material therein.

14. Means for sealing ducts of plastics glazing panels comprising plug means for individual ducts, the plug means including a drainage passage.
15. Means as claimed in claim 14, wherein the plug includes porous material.
16. Means as claimed in claim 15, wherein the porous material is a porous foam.
17. Means as claimed in claim 14, 15 or 16 including sealing members around the necks of the plugs for sealing against end of ducts of plastics panels.
18. An end cap for a ducted plastics panel substantially as hereinbefore described with reference to and as illustrated in any one of the accompanying drawings.



Application No: GB 0003338.1
Claims searched: 1-13, 18

Examiner: Dr. Lyndon Ellis
Date of search: 19 June 2000

-12-

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): E1D DF112

Int Cl (Ed.7): E04C, E04D

Other: Online: EPODOC, WPI, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
Y	GB 2283997 A (Ultraframe Plc) Whole document.	1-4, 6, 8 and 12
Y	GB 2267298 A (Newdawn and Sun Limited) Whole document, particularly page 4, third paragraph.	1-4, 6, 8 and 12

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.